# CONTRIBUTION TO PULMONARY SURGERY, WITH REPORT OF FOUR CASES OF PNEUMOTOMY[1].

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BY pneumotomy is meant an incision into the lung tissue. It is singular that for the first lesson on the subject, we must go back to the Father of Medicine, Hippocrates, who lays down the following rules: When, after pneumonia, an abscess forms, there is fever, dry cough, dyspnœa, swelling of the feet * * * you shall make an incision as low as possible on the side where the swelling and pain are; you shall incise between the ribs with a curved bistoury, first the integument, then with a straight bistoury, wrapped up in a cloth to within a finger nail's length of the end, plunge the instrument into the lung." Then he advises the introduction of a tent into the opening, letting out the pus morning and evening, and washing out the cavity through a canula with warm wine and oil, and at last putting in a lead canula, which he shortened from time to time as the cavity closed in. What is this but the modern treatment, which for so many ages gave way to other means, and which lay buried until our day when happily with the great boon which antiseptic surgery has given to mankind, our surgical field has enlarged to such an extent that there is no organ in the body beyond its sphere.

The sound advice of Hippocrates seems to have been a dead letter for centuries until Purrman, in 1692,[2] recommended surgical interference in pleuritic effusions, in wounds of the chest, in empyema and purulent effusions.

Next comes Baglavius[4] who, although he never operated himself, wrote the following masterly article, which I will quote in full. "Phthisis ab ulcero pulmonum, vulgo pro incurabili

[1] I am under great obligations to Professor Fenger, of Chicago, for literature on the subject.

derelinquitur, eoquia, ut aiunt, tale ulcus internum est, et occultum, nec ut alia externa ulcera modificari, et a pure abtergi potest; sed quare non id agunt medici ut investigent ulceris situm, eoquo detecto sectionem inter costas instituant, ut medicamenta introduxi possint rationem sane non agnosco? Elapso septennio cum esse Patavii vir quidam accepit vulnus in dextra thoracis parte ad pulmonem usque penetrans: quod vulneris genus quamvis lethale fit, chirurgus tanem solertissimus sectionem inter costas fecit per longitudinem fere sex digitorum, ut situm vulnerati pulmonis detegeret; eo digitur detecto per vulneraria sirigantionibus et turum dilis ntroducta, elapsis duobus mensibus perfecte cicatrigavit. Eamdem propemedum sedulitatem tentare deberent practitantes in curando pulmonum phthisicorum ulcere, ne tanto artis dedecore, catalogus morborum incurabilium quotidie in immensum augescat. Doctores medici? Mentis vires assiduis cogitationibus et usu accuntur; socordia vero, et desperatione fraguntur."

In 1763 Barry[5] reported many cases of pulmonary cavities which he had incised with the happiest results.

About the same time Shayse[6] wrote: "If there are pleuritic adhesions on the level of a cavity, incise into the cavity with a lancet. If there is great suppuration introduce a tent into the opening. After such an incision, many a person has lived a long while with a running fistula.

1783 Protean recommended the opening into the lung tissue, and then the plunging of the locker until the abscess cavity was reached.[7]

Callisen, in 1788,[8] advocates an incision and with the finger in the pleural cavity to detect the abscess, and make an incision into the lung tissue.

Now we come down to our own century, and we find that in 1812 Richerand[9] considers the operation as established beyond discussion. He even goes so far as to advocate an exploratory incision, and he relates the opening of a pulmonary abscess by Faye, in 1797.

The following year Jaymes[10] observed a similar case. Zang[11] reported 7 cases of pneumotomy in 1818; and Vincent favored opening and drainage; all his cases were successful.

In 1824[12] Masse performed the same operation.

We next come to the celebrated operations of Krimer in 1830[13] which created such a sensation all over France. Both of his patients, however, died; one six months after the operation, the other a short time after he was operated upon.

In 1830 McLeod, in 1831 Breschet[14], and in 1839 Clæssens reported the opening of pulmonary cavities.

Then follows the case of Hastings and Storks, and of Herff, in 1844, Brichetan, in 1851, and Collins, in 1855; and 13 operations of the celebrated surgeon Greaux[15] which were unfortunately not successful.

We now find a blank space in literature, as if the operation had fallen into disrepute or had never been known; until Mosler[16], in 1873, proposed and practiced it.

To him and to G. Bull, of Christiana, belongs the honor of having brought to such a successful point the operation as it is to-day.

In late years the work of W. Koch,[17] Cartaz,[18] Albert,[19] Martell,[20] and the works of Fenger, Hollester and Billingston in this country have greatly added to the literature of this interesting subject.

The indications for the operation are 1, pulmonary abscess; 2, gangrene; 3, pulmonary cavities; 4, for the removal of foreign bodies.

Pulmonary abscesses following pneumonia and bronchitis are rapidly fatal unless interfered with early.

Pulmonary gangrene unless circumscribed is too rapidly fatal to call the surgeon's attention; it is only in localized gangrene that we can interfere, as is clearly shown in Case 1.

Large pulmonary cavities cause a continual bronchial irritation, and may cause a fatal hæmorrhage; therefore, the advisability of opening them and facilitating their cicatrization.

Foreign bodies may cause abscesses and even gangrene, and their removal is urgently demanded.

*Modus operandi.*—In all my operations pieces of one or more ribs were excised in the following manner: After laying the rib bare, an incision was made in the middle line through the periosteum, which was reflected on both sides; then a Parker's retractor was inserted between the periosteum and the rib, and onthe retractor the rib was divided with a sharp pair of Liston's

forceps. This is a far safer and quicker method than with the chain saw; the sharp forceps will cut the rib as neatly as a chain saw and more rapidly. The removal of a section of a rib varying from 3 to 8 centimeters, or the so-called Estlander operation, is a very successful procedure when the cavity is large, as it brings down the chest wall and soon closes to the lung, thereby facilitating its closure. No washing out of the cavity was resorted to as it caused severe coughing in my first case. Strict antisepsis and frequent dressing was all that was found necessary. The nearest point to a cavity was the one usually selected, unless covered by the scapula or pectoral muscles. Drainage is indispensable; rubber, glass or gauze drainage giving the best results.

CASE I. *Gangrene of Lung Following Pneumonia.*—Thomas B., æt. 32 years, Irish, railway laborer, a man of very strong constitution, left his home for Northern Dakota, where he went to work at harvesting. While there he was taken sick, coughing, spitting bloody sputa; he had high fever and great thirst, and was delirious at times All the accommodation he had was a straw bed under a shed. When almost in extremis he was put on board of the train which took him home. His breath was so offensive that, to use his own expression, "he had the car all to himself." I saw him in September of 1884. On entering the house the characteristic odor of gangrene was readily recognized. I could examine him only after placing a towel soaked in a 5% solution of carbolic acid over his face. He was very weak and depressed; pulse was 126, temperature, 39.2°C. Physical examination revealed the following condition of his lungs: Right lung, complete dulness over lower third, respiratory murmur only heard over infraclavicular region; absent over rest of lung. Left lung normal. I introduced an aspirating needle in the lower lobe of the left lung, and drew out a dirty greenish fluid, with the characteristic odor of gangrene. My prognosis was unfavorable, and mentioning the fact that a formidable operation might save him, the patient readily consented to submit to it, and after some preliminary arrangements the next morning, I made an incision over the seventh rib in the axillary line, excising 3 centimetres of the rib. I then inserted an exploring needle into the gangrenous cavity; and my Paquelin cautery failing to work, I made my way into the pulmonary cavity with a scalpel and a pair of Pean's forceps. There were adhesions between the costal and pulmonary pleuræ, and when a drainage tube had been inserted into the

cavity, which was 2 centimetres long, a cupful of grangrenous looking fluid flowed out. Then I introduced a rubber drainage tube and put a Lister dressing over the whole side. The patient rallied nicely, and his troublesome cough and expectoration and constant nausea ceased. At no time did his temperature go above 38.5°C., except on the seventh day, when the drainage-tube slipped out, and the opening closed up; then he began to expectorate and complain of pain in the side, until the drainage-tube was re-inserted and the cavity washed out with a 3% solution of carbolic acid; this gave rise to a severe fit of coughing; and after this the cavity was only sponged out with a piece of gauze. The opening closed rapidly, and in six weeks the patient was discharged, and soon went to work as a trackman on the Northern Pacific Railroad, where he is now working in perfect health.

CASE II. *Abscess of Lung Following Gun-Shot Wound.—Pyopneumothorax.*—Jos. S., æt. 25 years, German, and a farmer, was always healthy up to the time of the accident, which occurred while unloading a shotgun, when the shell exploded and flew back, entering the right lung between the second and third rib. The shell was easily extracted, but as was afterward shown, pieces of his clothing were retained in the wound. Four weeks after the accident, I saw him in consultation with Dr. J. A. Dubois, of Sauk Center. I found the patient very much emaciated, suffering from dyspnœa, with high temperature and rapid pulse. Further examination revealed a wound between the 2d and 3d ribs, through which a greenish pus flowed; general dulness existed over the right lung; below the wound there was loss of respiratory murmur, and only a few rales could be heard below the 2d rib.

The diagnosis was pyothorax, and an Estlander operation was advised. The patient was brought here to my private hospital, and on December 2, 1884, the operation was performed by Dr. Dubois and myself. Pieces of the 3d, 4th, 5th, 6th and 7th ribs were extracted, varying in length from two centimetres to seven centimetres. While excising the 3d rib, an opening was made through the lung, through which pus, powder and shreds of clothing came out; the wound was dressed antiseptically. The patient was then in a satisfactory condition. Temperature had gone down from 39.5° C. before the operation, to 37.5° C. the next morning. The man made a good recovery and is now well. There remained a small fistulous opening for almost three months, but that soon healed up and left no lesion of the lung.

CASE III. *Pulmonary Abscess Following Measles.—Pneumotomy —Death.*—Alice G., æt. 17 years, American, was first seen with her physician, Dr. H. M. Post, on August 17, 1889 The patient had had

measles a month before, and had been losing flesh ever since, coughing and expectorating a good deal. On examination a cavity was detected in the middle lobe of the left lung. An operation was advised and performed the 20th of the same month; pieces of the 3d, 4th and 5th ribs of 4 centimetres were removed, and the abscess cavity opened with the cautery. The wound was packed with iodoform gauze.

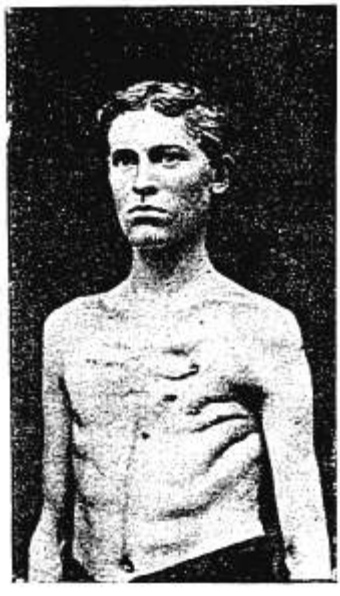

FIG. I, SHOWING RESULT OBTAINED BY RESECTION OF RIBS AND PNEUMOTOMY IN CASE II.

and a dressing of the same material applied. There was a good deal of shock, but she rallied nicely. The suppurating process went on, and she died of septicæmia two months after. No autopsy was allowed. This was a case of multiple abscess. The patient was of tuberculous stock.

. CASE IV. *Abscess of Lung Following Typhoid Fever—Pneumotomy—Recovery.*—George G., Irish, æt. 29 years. Operated Septem-

ber 27, 1888. This man having previously always been strong and healthy, contracted fever in the spring of 1888, and remained in bed for over two months. When he got up he complained of a pain in his side, and was generally troubled with coughing, which at first was slight. When I saw him he was expectorating daily large quantities of pus, and was very much emaciated. Physical examination revealed dulness over the lower lobe of the right lung, lessened respiratory murmur over the upper portion of lung. Left lung normal; temperature the night before the operation was 40°; had high chill and profuse diaphoresis.

My diagnosis was abscess of the lower lobe of the right lung.

I resected pieces of the 3d, 4th and 5th ribs in the axillary line, and an opening was made into the lung tissue with the thermo cautery, letting out a small quantity of pus.

The cavity was packed with iodoform gauze and the patient rallied nicely. The same evening temperature was 37.7°, and the next morning temperature was 37.2°; and at no time during his convalescence did it rise above 38.5°. The first dressing was changed on the second day; the second on the seventh day, and on October 12 the sinuses were closed, and the man discharged cured. He is now working on his farm, a well man.

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